

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior revisions, and listings, of claims in the application.

Listing of Claims:

1. (*Currently amended*) A method for downloading streaming data comprising the steps of:

[[a)] establishing connections between a user client and [[with]] a plurality of nodes;
dividing streaming data into a plurality of blocks for sequential download, said plurality of blocks including a first and second blocks;

dividing the first block of said streaming data into a plurality of sub blocks;

[[b)] sending a request for at least one of said sub blocks of streaming data to the plurality of nodes where connection is established to download the sub blocks;

[[c)] monitoring download state of the established connections, said user client receiving said sub blocks from said respective nodes via said established connections in parallel;
and

[[d)] redistributing said sub blocks of a bad connection to other node for download if one of said established connections is determined to be the bad connection based on said monitored download state to be downloaded from some of the nodes where connection is established according to the monitoring result;

wherein[[.]] the step of sending a request, the step of monitoring download state and the step of redistributing said sub blocks (b) to step (d) are repeated for downloading sub blocks included in the second [[next]] block when download of all sub blocks included in [[a]] the first block is completed are downloaded.

2. (*Currently amended*) The method of claim 1, further comprising the step of matching said plurality of sub blocks included in the first block with each of said nodes determining sub blocks to download from each of the nodes where connection is established.

3. (*Currently amended*) The method of claim 1, wherein the step of monitoring download state [[c)] comprises the step of monitoring completion of download for each of said connected nodes, the step of redistributing said sub blocks comprises the step of redistributing sub blocks

from a first node to a second node when download is completed at the second node if there exists a connection where sub-block download is completed.

4. (*Currently amended*) The method of claim 2, wherein said match of the sub blocks and the nodes is determined based on connection state valuation index, the connection state valuation index being calculated using information selected from group consisting of round-trip time with each of the nodes and average download speed from each of the nodes, the sub-blocks to be downloaded from each of the nodes are determined by calculating connection state valuation index.

5 - 7. (*Cancelled*)

8. (*Currently amended*) The method of claim 7, wherein if the first node has the lowest download rate among the connected nodes, the step of redistributing said sub blocks comprises the step of: determining redistribution of said sub blocks from the first node to the second node based on the download rate and a number of remaining sub blocks of the first node, the step for redistributing sub blocks between a connection where sub block download is completed and a connection of which the download rate is the lowest comprises the steps of:

determining download speed of the connection where the sub block download is completed and the connection of which the download rate is the lowest;

determining the number of remaining sub blocks to download in the connection of which the download rate is the lowest;

determining if redistribution of sub blocks is necessary;

redistributing the remaining sub blocks between the connection where sub block download is completed and the connection of which the download rate is the lowest according to rate of the download speed if sub block redistribution is necessary.

9. (*Original*) The method of claim 1, further comprising the step of storing information of nodes with which the connection establishment failed in a black list queue.

10. (*Original*) The method of claim 2, further comprising the step of receiving node state information, wherein the sub blocks to be downloaded from each of the nodes are determined using the node state information.

11. (*Original*) The method of claim 2, wherein sub blocks to be downloaded from each of the nodes are determined by state information of nodes in initial state of download, after determination of download speed from each of the nodes, sub blocks to be downloaded from each of the nodes are determined using connection state valuation index which is calculated using information selected from group consisting of round-trip time with each of the nodes and average download speed from each of the nodes.

12. (*Currently amended*) The method of claim 10, wherein the connection establishment with the plurality of nodes are performed using state information of the nodes in step of establishing connections [(a)].

13. (*Original*) The method of claim 1, further comprising the step of determining download error using checksum value of downloaded sub blocks.

14. (*Original*) The method of claim 1, further comprising the step of sending a request for sub blocks to corresponding nodes by the redistribution result to download redistributed sub blocks after redistribution of sub blocks.

15. (*Original*) The method of claim 1, further comprising the step of downloading streaming data by connecting to a singular server if sub block download from the plurality of the nodes fails.

16. (*Currently amended*) The method of claim 1, further comprising the steps of:
monitoring state information of nodes which are not transmitting data among nodes where connection is established; and

redistributing sub blocks to be downloaded between some of the nodes which are transmitting data and some of the nodes which are not transmitting data.

17 - 32. (*Cancelled*)

33. (*Withdrawn*) A connection control server connected with a plurality of user clients through network for controlling connection between the user clients in order for a user client to download streaming data by connecting other user clients, comprising:

a mesh manager module for receiving information of contents stored in the connected plurality of user clients and address information of the connected plurality of user clients, and providing information of nodes that store requested contents to a user client which requested contents; and

a mesh information database for storing information of contents stored in each of the user clients and address information of each of the user clients;

wherein a communication agent program is installed in the plurality of user clients, the communication agent program controls user clients to establish connections with a plurality of nodes using the node information, and to send a request for sub blocks of streaming data to download to the connected nodes, and to redistribute sub blocks to download by monitoring download state of each of the connected nodes.

34. (*Withdrawn*) The server of claim 33, further comprising an authentication module for authenticating users and processing billing information.

35. (*Withdrawn*) The server of claim 33, further comprising a user database for storing information of registered users and a meta information database for storing meta information of streaming data.

36. (*Withdrawn*) The server of claim 33, wherein the mesh manager module receives state information of each of the nodes and provides the state information with the node information.

37. (*Withdrawn*) A connection control server connected with a plurality of user clients and a plurality of contents servers through network for controlling connection between the user clients and the contents servers in order for a user client to download streaming data by connecting at least two contents servers, comprising:

a server state determining module for receiving state information from the connected plurality of contents servers and determining state of each of the contents servers;

a server list providing module for providing list information of servers to transmit streaming data of requested contents when receiving contents request information from a user client;

wherein a communication agent program is installed in the user clients, the communication agent program controls the user clients to establish connections with at least two contents servers using the server list information, and to determine sub blocks of streaming data to download from each of the connected contents servers to request sub blocks, and to redistribute sub blocks to download by monitoring download state of sub blocks from each of the connected nodes.

38. (*Withdrawn*) The server of claim 37, wherein the state information provided from the contents servers is selected form group consisting of bandwidth information, CPU usage information, memory usage information, the number of connected users, and file I/O information.

39. (*Currently amended*) One or more storage media having stored thereon a computer program that, when executed by one or more processors, causes the one or more processors to perform acts including:

[[(a)]] establishing connections between a user client and [[with]] a plurality of nodes;
dividing streaming data into a plurality of blocks for sequential download, said plurality of blocks including a first and second blocks;

dividing the first block of said streaming data into a plurality of sub blocks;

[[b)] sending a request for at least one of said sub blocks of streaming data to the plurality of nodes where connection is established to download the sub blocks;

[[c)] monitoring download state of the established connections, said user client receiving said sub blocks from said respective nodes via said established connections in parallel;
and

[[d)] redistributing said sub blocks of a bad connection to other node for download if one of said established connections is determined to be the bad connection based on said monitored download state to be downloaded from some of the nodes where connection is established according to the monitoring result;

wherein[[,)] the step of sending a request, the step of monitoring download state and the step of redistributing said sub blocks (b) to step (d) are repeated for downloading sub blocks included in the second [[next]] block when download of all sub blocks included in [[a)] the first block is completed are downloaded.

40. *(Currently amended)* The one or more storage media of claim 39, further comprising the step of matching said plurality of sub blocks included in the first block with each of said nodes determining sub blocks to download from each of the nodes where connection is established.

41. *(Currently amended)* The one or more storage media of claim 40, wherein said match of the sub blocks and the nodes is determined based on connection state valuation index, the connection state valuation index being calculated using information selected from group consisting of round-trip time with each of the nodes and average download speed from each of the nodes, the sub blocks to be downloaded from each of the nodes are determined by calculating connection state valuation index.

42. *(Cancelled)*

43. *(Previously Presented)* The one or more storage media of claim 40, further comprising the step of receiving node state information, wherein the sub blocks to be downloaded from each of the nodes are determined using the node state information.

44. *(Previously Presented)* The one or more storage media of claim 43, wherein the connection establishment with the plurality of nodes are performed using state information of the nodes in step (a).

45. *(Previously Presented)* The one or more storage media of claim 40, wherein sub blocks to be downloaded from each of the nodes are determined by state information of nodes in initial state of download, after determination of download speed from each of the nodes, sub blocks to be downloaded from each of the nodes are determined using connection state valuation index which is calculated using information selected from group consisting of round-trip time with each of the nodes and average download speed from each of the nodes.

46. *(Cancelled)*

47. *(Currently amended)* The one or more storage media of claim 46, wherein the step of monitoring download state comprises the step of monitoring completion of download for each of said connected nodes, the step [(d)] of redistributing said sub blocks comprises the step of redistributing sub blocks from a first node to a second node when download is completed at the second node between a connection where sub block download is completed and some of the connections where sub block download is not completed when a connection where sub block download is completed exists.

48. *(Currently amended)* The one or more storage media of claim 47, wherein the first node has the lowest download rate among the connected nodes, the step (d) comprises the step of redistributing sub blocks between a connection where sub block download is completed and a connection of which download rate is the lowest among connections where sub block download is not completed.

49. *(Currently amended)* The one or more storage media of claim 48, the step [(for)] of

~~redistributing said sub blocks between a connection where sub block download is completed and a connection of which the download rate is the lowest comprises the steps of:~~

~~determining redistribution of said sub blocks from the first node to the second node based on the download rate and a number of remaining sub blocks of the first node, download speed of the connection where the sub block download is completed and the connection of which the download rate is the lowest;~~

~~determining the number of remaining sub blocks to download in the connection of which the download rate is the lowest;~~

~~determining if redistribution of sub blocks is necessary;
redistributing the remaining sub blocks between the connection where sub block download is completed and the connection of which the download rate is the lowest according to rate of the download speed if sub block redistribution is necessary.~~

50. *(Previously Presented)* The one or more storage media of claim 39, further comprising the step of storing information of nodes with which the connection establishment failed in a black list queue.

51. *(Previously Presented)* The one or more storage media of claim 39, further comprising the step of determining download error using checksum value of downloaded sub blocks.

52. *(Previously Presented)* The one or more storage media of claim 39, further comprising the step of sending a request for sub blocks to corresponding nodes by the redistribution result to download redistributed sub blocks after redistribution of sub blocks.

53. *(Previously Presented)* The one or more storage media of claim 39, further comprising the step of downloading streaming data by connecting to a singular server if sub block download from the plurality of the nodes fails.

54. *(Previously Presented)* The one or more storage media of claim 39, further comprising the steps of: monitoring state information of nodes which are not transmitting data among nodes

where connection is established; redistributing sub blocks to be downloaded between some of the nodes which are transmitting data and some of the nodes which are not transmitting data.